

U.S. Patent Application Serial No. 10/532,084
Amendment filed October 3, 2006
Reply to OA dated July 3, 2006

REMARKS

Claims 1-6 and 8-20 are presented for examination. Claim 7 was cancelled in a previous amendment. Claims 1 and 12 have been amended in order to more particularly point out, and distinctly claim the subject matter to which the applicants regard as their invention. The amendments to claims 1 and 12 are based on p. 9, lines 18-22, and p.11, lines 13 to 19, of the specification.

The applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **July 3, 2006**.

Claims 1-6 and 8-20 define a conductive resin composition. In particular, the claims recite a separator for a fuel cell comprising a conductive resin composition wherein *a hydroxyl value of epoxy(meth)acrylate is controlled* in order to obtain a molded article having improved durability due to increased corrosion resistance.

Claim 10 is objected to because of the following informalities: In claim 10, when the total B, C, D components are used in amount of 51 wt% and minimum amount of component A is 50 wt%, the total exceeds 100 wt%.

In a previous amendment filed on May 30, 2006, the applicants amended claim 10 so that “the total percentage of (A), (B), (C), and (D) is 100%.” As amended, claim 10 limits the total

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percentage to equal 100%. Therefore, claim 10 limits the claimed invention from being a “summation of boundary value of component A to 50 wt% with maximum amount of components B, C, D,” which would result in 101 wt%, a value beyond the scope claim 10. (Second Office Action, p.2, lines 7-9).

For this reason, we respectfully request that this objection be reconsidered and withdrawn.

Claims 1-4 and 8-20 are rejected under 35 USC 103(a) as being obvious in light of Okumura, et al. (U.S. Patent Application 2002/0055030) in view of Hendershot, et al. (U. S. Patent No. 6,441,060), Hefner, Jr., et al. (U.S. Patent No. 4,618,658), and Nagasawa, et al. (U.S. Patent No. 4,205,018).

As amended, claims 1 and 12 limit the hydroxyl value of epoxy(meth)acrylate, and adjust the amount of polyisocyanate in relation to the number of hydroxyl group of the epoxy(meth)acrylate., in order to achieve an unexpected result of an increase in mechanical strength due to less water absorption or hydrolysis.

Okumura, Hendershot, Hefner, Jr., and Nagasawa fail to teach the present invention recited in amended claims 1 and 12 because the combined disclosure of the references do not disclose the unexpected result of the claimed invention. **Okumura, Hendershot, Hefner, Jr., and Nagasawa**, in combination, teach a conductive resin comprising a conductive filler, urethane-modified epoxy (meth)acrylate resin, a (meth)acrylate, and other ethylenically unsaturated monomer

which is copolymerizable with the urethane-modified epoxy(meth)acrylate (B) and the (meth)acrylate (C). In regards to the motivation to combine the references, the Office Action points out that **Henderson** and **Nagasawa** disclose improved bench life, curability, and solvent resistivity in binders comprised of urethane-modified epoxy(meth)acrylate. Unlike the claimed invention, the combined disclosure of the cited references do not teach that an increase in mechanical strength can be achieved by decreasing water absorption or hydrolysis through *reaction of the hydroxyl group of the epoxy (meth)acrylate with a polyisocyanate resulting in less hydroxyl groups than epoxy(meth)acrylate*.

The claimed invention is directed toward improving durability of the resin composition by decreasing the number of hydroxyl groups. In particular, the specification describes that prior art separators are “inferior in corrosion resistance, particularly durability such as hydrolysis resistance,” because epoxy(meth)acrylate resin generally has a lot of hydroxyl groups and, therefore, the molded article made of the resin has high water absorption and decreased strength thereby. (Specification, lines 20-25). Accordingly, in the claimed invention, epoxy(meth)acrylate is reacted with polyisocyanate specifically in order to decrease the number of hydroxyl groups. In other words, in a patentable distinction over the combined disclosure of the cited references, claims 1 and 12 limit the hydroxyl value of epoxy(meth)acrylate, and adjust the amount of polyisocyanate in relation to the number of hydroxyl group of the epoxy(meth)acrylate, in order to achieve an unexpected result of an increase in mechanical strength due to less water absorption or hydrolysis. (See Specification, p. 30-32, Tables 1-4).

Okumura, Hendershot, Hefner, Jr., and Nagasawa fail to teach the present invention recited in claims 1-4 and 8-20 because the combined disclosure of the references do not disclose that an increase in mechanical strength can be achieved by decreasing water absorption or hydrolysis through reaction of the hydroxyl group of the epoxy (meth)acrylate with a polyisocyanate resulting in less hydroxyl groups than epoxy(meth)acrylate.

It is respectfully requested that this rejection be reconsidered and withdrawn.

Claim 6 is rejected under 35 USC 103(a) as being unpatentable over Okumura in view of Hendershot, Hefner, Jr., Nagasawa, and further in view of Takeshi, et al. (JP 2000-351843).

As discussed above, **Okumura, Hendershot, Hefner, Jr., Nagasawa, and Takeshi**, fail to teach the present invention recited in claim 6 because the combined disclosure of the references do not disclose limiting the hydroxyl value of the epoxy(meth)acrylate, and adjusting the amount of polyisocyanate in relation to the number of hydroxyl group of the epoxy(meth)acrylate.

It is respectfully requested that this rejection be reconsidered and withdrawn.

Claim 5 is rejected under 35 USC 103(a) as being unpatentable over Okumura in view of Hendershot, Hefner, Jr., Nagasawa, and further in view of Toshiro, et al. (JP 03-199230).

As discussed above, **Okumura, Hendershot, Hefner, Jr., Nagasawa, and Toshiro**, fail to teach the present invention recited in claim 5 because the combined disclosure of the references do

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not disclose limiting the hydroxyl value of the epoxy(meth)acrylate, and adjusting the amount of polyisocyanate in relation to the number of hydroxyl group of the epoxy(meth)acrylate.

It is respectfully requested that this rejection be reconsidered and withdrawn.

In view of the aforementioned amendments and accompanying remarks, claims 1-6 and 8-20, as amended, are in condition for allowance, which action, at an early date, is requested.

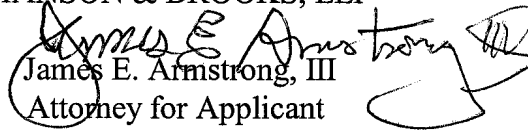
If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

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In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Request for Continued Prosecution

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